

$\Lambda(2110)$ 5/2⁺ $I(J^P) = 0(\frac{5}{2}^+)$ Status: ***

For results published before 1974 (they are now obsolete), see our 1982 edition Physics Letters **111B** 1 (1982). All the references have been retained.

This resonance is in the Baryon Summary Table, but the evidence for it could be better.

 $\Lambda(2110)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
2090 to 2140 (≈ 2110) OUR ESTIMATE			
2092 \pm 25	GOPAL 80	DPWA	$\bar{K}N \rightarrow \bar{K}N$
2125 \pm 25	CAMERON 78B	DPWA	$K^- p \rightarrow N\bar{K}^*$
2106 \pm 50	DEBELLEFON 78	DPWA	$\bar{K}N \rightarrow \bar{K}N$
2140 \pm 20	DEBELLEFON 77	DPWA	$K^- p \rightarrow \Sigma\pi$
2100 \pm 50	GOPAL 77	DPWA	$\bar{K}N$ multichannel
2112 \pm 7	KANE 74	DPWA	$K^- p \rightarrow \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2137	BACCARI 77	DPWA	$K^- p \rightarrow \Lambda\omega$
2103	¹ NAKKASYAN 75	DPWA	$K^- p \rightarrow \Lambda\omega$

 $\Lambda(2110)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
150 to 250 (≈ 200) OUR ESTIMATE			
245 \pm 25	GOPAL 80	DPWA	$\bar{K}N \rightarrow \bar{K}N$
160 \pm 30	CAMERON 78B	DPWA	$K^- p \rightarrow N\bar{K}^*$
251 \pm 50	DEBELLEFON 78	DPWA	$\bar{K}N \rightarrow \bar{K}N$
140 \pm 20	DEBELLEFON 77	DPWA	$K^- p \rightarrow \Sigma\pi$
200 \pm 50	GOPAL 77	DPWA	$\bar{K}N$ multichannel
190 \pm 30	KANE 74	DPWA	$K^- p \rightarrow \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
132	BACCARI 77	DPWA	$K^- p \rightarrow \Lambda\omega$
391	¹ NAKKASYAN 75	DPWA	$K^- p \rightarrow \Lambda\omega$

 $\Lambda(2110)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 N\bar{K}$	5–25 %
$\Gamma_2 \Sigma\pi$	10–40 %
$\Gamma_3 \Lambda\omega$	seen
$\Gamma_4 \Sigma(1385)\pi$	seen
$\Gamma_5 \Sigma(1385)\pi$, P-wave	
$\Gamma_6 N\bar{K}^*(892)$	10–60 %
$\Gamma_7 N\bar{K}^*(892)$, $S=1/2$, F-wave	

The above branching fractions are our estimates, not fits or averages.

 $\Lambda(2110)$ BRANCHING RATIOS

See "Sign conventions for resonance couplings" in the Note on Λ and Σ Resonances.

$\Gamma(N\bar{K})/\Gamma_{\text{total}}$	Γ_1/Γ
0.05 to 0.25 OUR ESTIMATE	
0.07 \pm 0.03	
0.27 \pm 0.06	GOPAL 80 DPWA $\bar{K}N \rightarrow \bar{K}N$
• • • We do not use the following data for averages, fits, limits, etc. • • •	
0.07 \pm 0.03	GOPAL 77 DPWA See GOPAL 80

NODE=B035

NODE=B035

NODE=B035M

NODE=B035M

→ UNCHECKED ←

NODE=B035W

NODE=B035W

→ UNCHECKED ←

NODE=B035215;NODE=B035

DESIG=1;OUR EST

DESIG=2;OUR EST

DESIG=3;OUR EST

DESIG=4;OUR EST

DESIG=41

DESIG=5;OUR EST

DESIG=56

NODE=B035220

NODE=B035220

NODE=B035R2

NODE=B035R2

→ UNCHECKED ←

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2110) \rightarrow \Sigma \pi$				$(\Gamma_1 \Gamma_2)^{1/2} / \Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
+0.14 ± 0.01	DEBELLEFON 77	DPWA	$K^- p \rightarrow \Sigma \pi$	
+0.20 ± 0.03	KANE 74	DPWA	$K^- p \rightarrow \Sigma \pi$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
+0.10 ± 0.03	GOPAL 77	DPWA	$\bar{K}N$ multichannel	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2110) \rightarrow \Lambda \omega$				$(\Gamma_1 \Gamma_3)^{1/2} / \Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<0.05	BACCARI 77	DPWA	$K^- p \rightarrow \Lambda \omega$	
0.112	¹ NAKKASYAN 75	DPWA	$K^- p \rightarrow \Lambda \omega$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2110) \rightarrow \Sigma(1385)\pi$				$(\Gamma_1 \Gamma_4)^{1/2} / \Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
+0.071 ± 0.025	³ CAMERON 78	DPWA	$K^- p \rightarrow \Sigma(1385)\pi$	

$(\Gamma_i \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $N\bar{K} \rightarrow \Lambda(2110) \rightarrow N\bar{K}^*(892)$				$(\Gamma_1 \Gamma_6)^{1/2} / \Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
-0.17 ± 0.04	⁴ CAMERON 78B	DPWA	$K^- p \rightarrow N\bar{K}^*$	

$\Lambda(2110)$ FOOTNOTES

¹ Found in one of two best solutions.

² The published error of 0.6 was a misprint.

³ The CAMERON 78 upper limit on F -wave decay is 0.03. The sign here has been changed to be in accord with the baryon-first convention.

⁴ The published sign has been changed to be in accord with the baryon-first convention. The CAMERON 78B upper limits on the P_3 and F_3 waves are each 0.03.

$\Lambda(2110)$ REFERENCES

PDG	82	PL 111B 1	M. Roos <i>et al.</i>	(HELS, CIT, CERN)
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL) IJP
CAMERON	78	NP B143 189	W. Cameron <i>et al.</i>	(RHEL, LOIC) IJP
CAMERON	78B	NP B146 327	W. Cameron <i>et al.</i>	(RHEL, LOIC) IJP
DEBELLEFON	78	NC 42A 403	A. de Bellefon <i>et al.</i>	(CDEF, SACL) IJP
BACCARI	77	NC 41A 96	B. Baccari <i>et al.</i>	(SACL, CDEF) IJP
DEBELLEFON	77	NC 37A 175	A. de Bellefon <i>et al.</i>	(CDEF, SACL) IJP
GOPAL	77	NP B119 362	G.P. Gopal <i>et al.</i>	(LOIC, RHEL) IJP
NAKKASYAN	75	NP B93 85	A. Nakkasyan	(CERN) IJP
KANE	74	LBL-2452	D.F. Kane	(LBL) IJP

NODE=B035R1

NODE=B035R1

NODE=B035R3

NODE=B035R3

NODE=B035R4

NODE=B035R4

NODE=B035R5

NODE=B035R5

NODE=B035

NODE=B035;LINKAGE=A

NODE=B035;LINKAGE=C

NODE=B035;LINKAGE=D

NODE=B035;LINKAGE=E

NODE=B035

REFID=41167

REFID=31755

REFID=31837

REFID=31838

REFID=31968

REFID=31932

REFID=31985

REFID=31750

REFID=31931

REFID=31759